## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 10 June 2004 (10.06.2004)

**PCT** 

## (10) International Publication Number WO 2004/048969 A1

(51) International Patent Classification<sup>7</sup>: E21B 49/10

G01N 33/28,

(21) International Application Number:

PCT/GB2003/005016

(22) International Filing Date:

19 November 2003 (19.11.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0227267.2

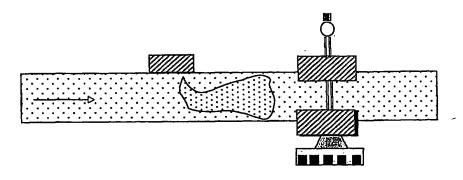
22 November 2002 (22.11.2002) GB

(71) Applicants (for all designated States except US): SCHLUMBERGER TECHNOLOGY B.V. [NL/NL]; Parkstraat 83-89, NL-2514 JG The Hague (NL). PETRO-LEUM RESEARCH AND DEVELOPMENT N.V. [NL/NL]; De Ruyterkade 62, Willemstad, Curacao (AN). SCHLUMBERGER CANADA LIMITED [CA/CA]; 525-3rd Avenue S.W, Calgary, Alberta, Canada T2P 0G4 (CA). SCHLUMBERGER HOLDINGS LIMITED [—/—]; P.O. Box 71, Craigmuir Chambers, Road Town, Tortola (VG). SCHLUMBERGER OILFIELD ASSIS-TANCE LIMITED [—/—]; Craigmuir Chambers, Road Town, Tortola (VG). SCHLUMBERGER OVERSEAS S.A. [PA/PA]; 8 Calle Aquilino de la Guardia, Panama City (PA). SCHLUMBERGER SEACO INC. [PA/PA]; 8 Calle Aquilino de la Guardia, Panama City, Panama (PA). SCHLUMBERGER SERVICES LIMITED [--/-P.O. Box 438, Tortola (VG). SCHLUMBERGER SURENCO S.A. [PA/PA]; 8 Calle Aquilino de la Guardia, Panama City, Panama (PA). SERVICES PETROLIERS SCHLUMBERGER [FR/FR]; 42, rue Saint-Dominique, F-75007 Paris (FR).

- (72) Inventors; and
- (75) Inventors/Applicants (for US only): RAGHURAMAN, Bhavani [US/US]; 12 Indian Rock Place, Wilton, CT 06897 (US). GOODWIN, Anthony, Robert, Holmes [US/US]; 5323 Rebel Ridge Drive, Sugar Land, TX 77478 (US). MULLINS, Oliver, Clinton [US/US]; 48 Lewis Drive, Ridgefield, CT 06877 (US). RABBITO, Philip, Andrew [US/US]; 146 Merwin Avenue, Milford, CT 06460 (US). JIANG, Li [GB/GB]; 47 Almoners Avenue, Cambridge CB1 8NZ (GB). JONES, Timothy, Gareth, John [GB/GB]; 16 Denmark Road, Cottenham, Cambridgeshire CB4 8QS (GB). KURKJIAN, Andrew, Loris [US/US]; 3327 Oakland Drive, Sugar Land, TX 77479 (US). GUSTAVSON, Gale, Hyslip [US/US]; 3 Farview Road, Brookfield, CT 06804 (US).
- (74) Agent: MIRZA, Akram, Karim; Intellectual Property Law Department, Schlumberger Cambridge Research Limited, High Cross, Madingley Road, Cambridge CB3 0EL (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR ANALYSING DOWNHOLE WATER CHEMISTRY



(57) Abstract: The invention concerns an apparatus for analysing water chemistry. According to the invention, the apparatus is adapted to operate downhole and comprises a colouring agent supply device for supplying a colouring agent to a water sample, the colour of the water sample thus supplied being indicative of the water sample chemistry, and a colorimetric analyser arranged to determine the colour of the water sample.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

- with international search report

 before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.